

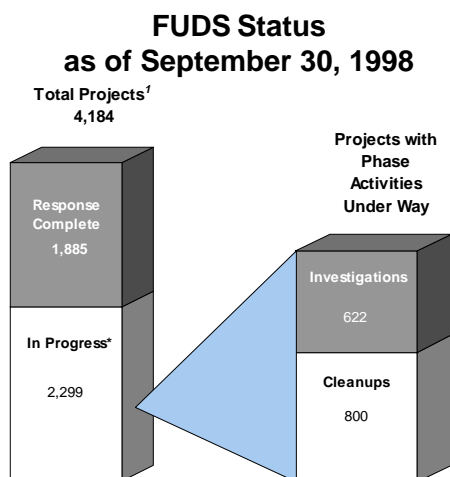


FUDS

Cleanup Status and Progress

"The Corps of Engineers' commitment to developing and fostering cooperative relationships with all interested parties in the cleanup of formerly used properties has enabled it to better accomplish its mission of protecting human health and the environment, ensuring a rapid and efficient response to environmental hazards."

— **RAYMOND J. FATZ, DEPUTY ASSISTANT SECRETARY OF THE ARMY**



* NOTE: IN-PROGRESS INCLUDES PROJECTS THAT WILL BE UNDER WAY IN THE FUTURE. THEREFORE, TOTALS OF PROJECTS WITH PHASE ACTIVITIES UNDER WAY ARE GENERALLY LESS THAN THE TOTAL NUMBER OF SITES (PROJECTS) IN PROGRESS.

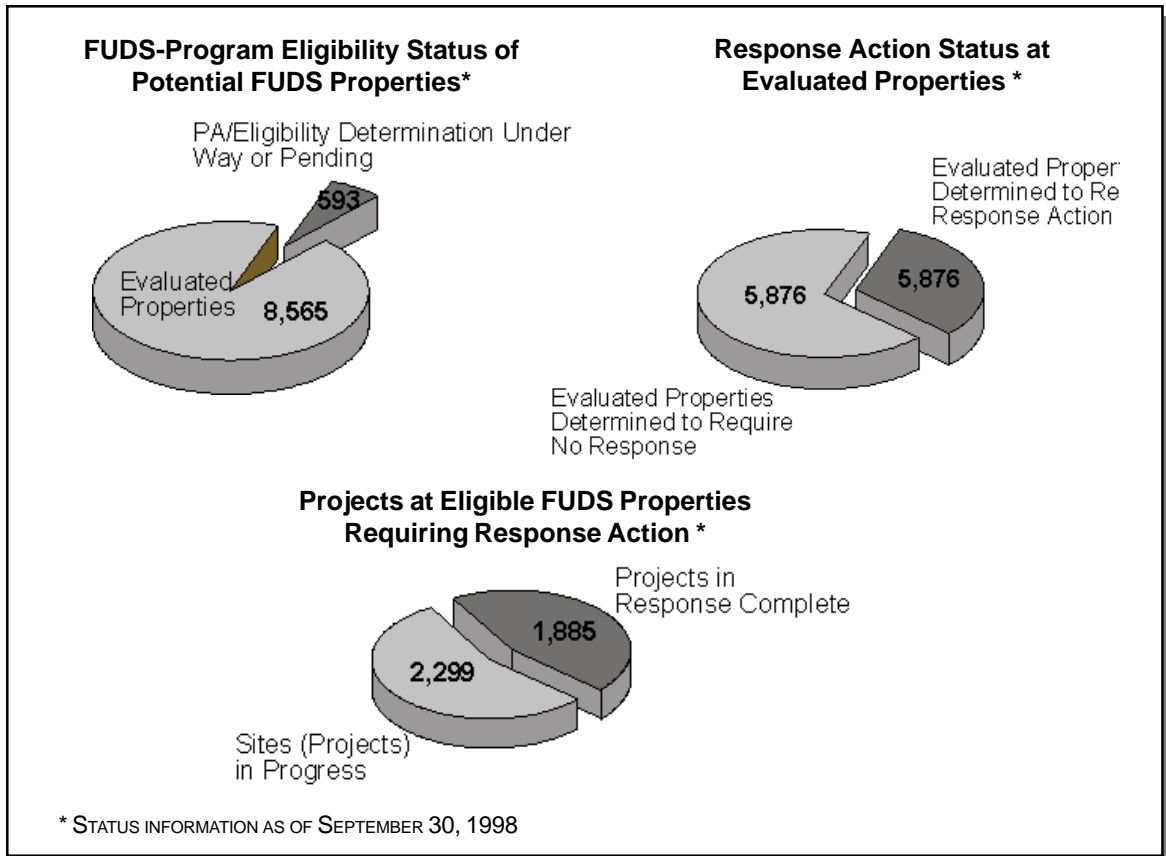
The Department of Defense (DoD) is responsible for cleaning up properties that were formerly owned, leased, possessed, or operated by DoD. Such properties are known as Formerly Used Defense Sites (FUDS). The Army is the executive agent for the program, and the U.S. Army Corps of Engineers (USACE) is the executing agent that manages and executes the program. Because DoD no longer owns or uses the FUDS properties, a USACE district effectively serves as the installation commander charged with executing environmental cleanup projects and associated responsibilities.

The scope and magnitude of the FUDS program are significant, with 9,158 properties identified for potential inclusion in the program. Environmental cleanup procedures at FUDS are similar to those at active DoD installations. However, information about the origin and extent of contamination, land transfer issues, past and

present property ownership, and program policies must be evaluated before DoD considers a property eligible for the FUDS program.

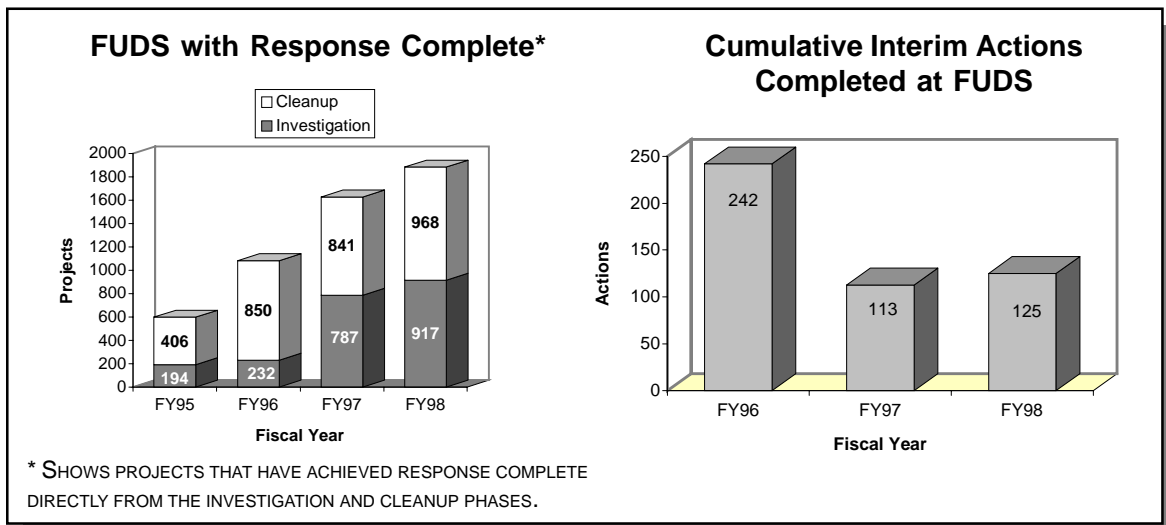
In fiscal year 1998 (FY98), 80 properties were added to the FUDS inventory, and preliminary assessments (PAs) were completed at 32 properties. Overall, 94 percent, or 8,565, of the 9,158 properties have been evaluated through the PA process, and 2,689 properties have been identified as requiring environmental response actions. On the 2,689 eligible properties, 4,184 potential cleanup projects¹ have been identified, and 1,885

¹ FUDS cleanup projects are equivalent to sites. The term project will be used in place of sites throughout the FUDS section.



of these projects have been completed. The total cost for completing the remaining 2,299 projects is estimated at \$4.92 billion.²

FUDS project categories include hazardous, toxic, and radioactive wastes (HTRW); ordnance and explosives wastes (OEW); containerized HTRW (CON/HTRW), such as removal of underground storage tanks; building demolition and debris removal (BD/DR); and potentially responsible party (PRP) actions.



² FY99-Completion does not include inflation adjustment for cost-to-complete beyond FY2005. The cost to complete (FY06-Complete) is based on FY99 dollars.

During FY98, USACE headquarters officially responded to 25 congressional actions and one gubernatorial action, in addition to many informal congressional inquiries. USACE districts also responded to many additional congressional letters.

Program Execution

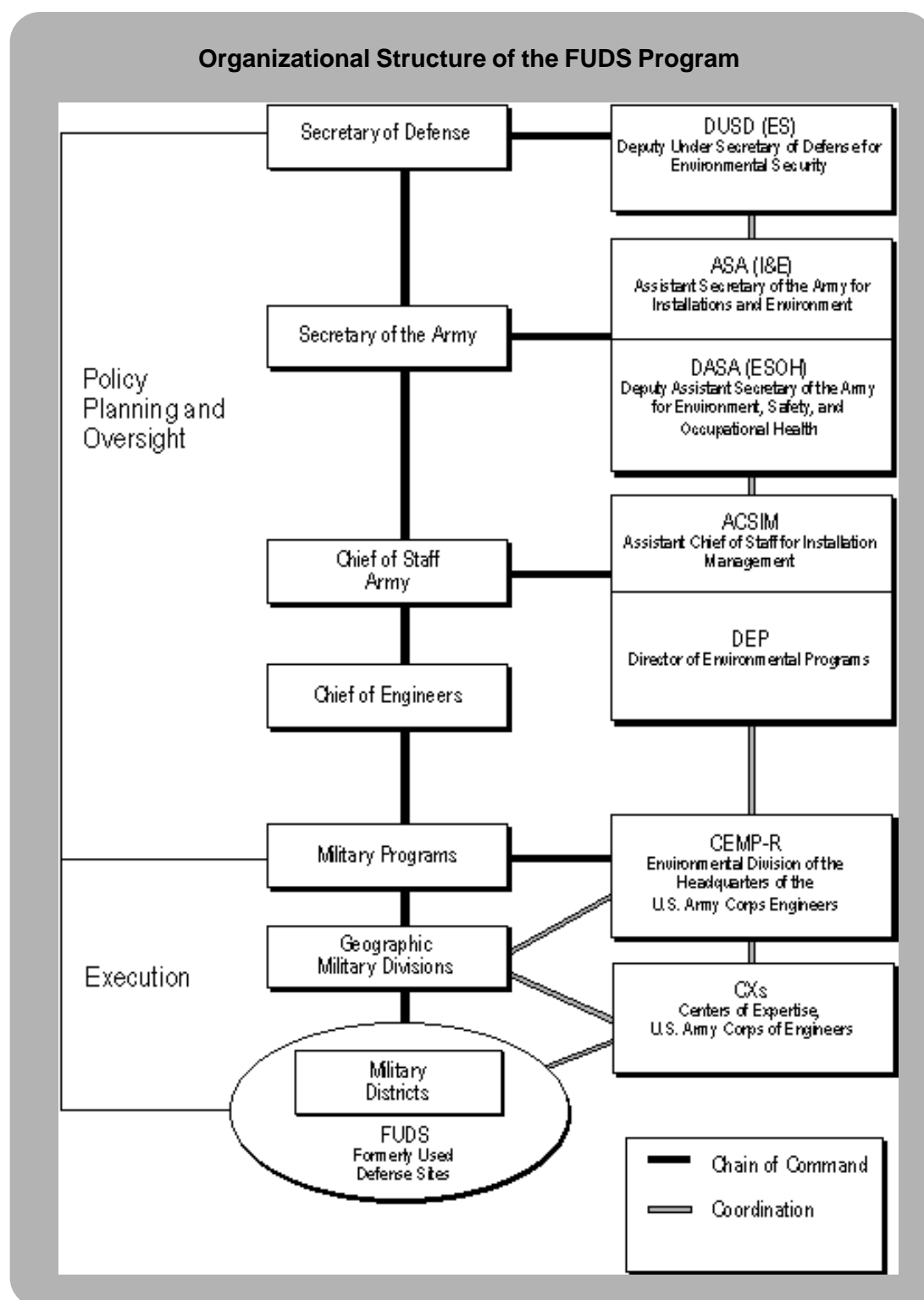
USACE helps the Army and DoD meet the challenge of protecting and cleaning up the environment through an organization that includes a headquarters, divisions, districts, laboratories, and centers of expertise. More than 92 percent of USACE environmental staff are on the front lines in USACE districts, executing projects. The divisions supervise design districts that perform studies and create designs and geographic military districts that manage projects and supervise construction. Cleanup activities at FUDS properties are supported by an HTRW center of expertise and an ordnance and explosives (OE) center of expertise (both of which are responsible for technical oversight) and by research and development laboratories. The USACE environmental program encompasses all four pillars of the Army's environmental program (compliance, restoration, preservation, and conservation) and has as its goals the prudent stewardship of taxpayer funds and the responsible protection of human health and the environment. The USACE environmental program budget has grown from approximately \$400 million in FY90 to more than \$1.5 billion in FY98. The FUDS share of the program's FY98 budget was \$242.3 million.

Goals and Priorities

The goal of the FUDS program is to reduce, in a timely and cost-effective manner, risk to human health, human safety, and the environment resulting from past DoD activities at these properties. Meeting environmental goals for FUDS properties depends on strong communication, partnerships, and community involvement among DoD and project stakeholders. Priorities for the FUDS program are based on an evaluation of relative risk and other factors, such as legal agreements, stakeholder concerns, and economic considerations.

Structure of Service

DoD is responsible for overall FUDS program policy and budget guidance, developing and defending the budget, and reviewing program performance. The Secretary of the Department of the Army is the program's executive agent and, through the Assistant Secretary of the Army (Installations and Environment) (ASA(I&E)), supplements DoD policies and oversees the program. The Director of Environmental Programs within the Office of the Assistant Chief of Staff for Installation Management establishes general program goals and, in concert with ASA(I&E), approves the annual work plan and program priorities. USACE headquarters is responsible for FUDS program management and execution. The FUDS mission within USACE is executed by the field organization, which consists of 7 geographic military divisions; 18 military districts, with necessary support from civil works districts; 1 HTRW center of expertise; and 1 OE center of expertise.



Program Accomplishments

USACE continues to emphasize executing projects, cleaning up sites, and ensuring that the public is an active participant in the cleanup process. Project execution figures for FY98 demonstrate that the FUDS program is making significant progress. As of September 30, 1998, 1,885 FUDS projects had reached response complete.

The following success story exemplifies the FUDS program's accomplishments in FY98.



Cleanup Program in Action:

Fire Training Simulators: Manchester Annex Superfund Site

In the fourth quarter of FY98, USACE, Seattle District, completed the demolition and cleanup of the fire training simulators at the former Naval Fire Training School at the Old Navy Dump/Manchester Annex Superfund Site.

This interim remedial action, which was completed in August 1998, involved removal and off-site disposal and recycling of 38,600 gallons of contaminated water, 876 gallons of petroleum product, 250 tons of concrete demolition debris, and 27 tons of scrap metal. USACE, Seattle District, closed the fire training simulator structures and the adjacent underground storage tanks and piping in place by cleaning them, demolishing them to below ground surface, and backfilling the site with approximately 700 cubic yards of clean fill.

Removing the fire training simulators early in the remedial design process has allowed USACE, Seattle District, to eliminate many unknowns in the design of the final cleanup remedy for the site. Remedial design of the overall cleanup remedy is scheduled for completion in the second quarter of FY99. Remedial action is scheduled for FY99 to FY00, at a current estimated cleanup cost of \$5.4 million.

The successful cleanup of the former Naval Fire Training School was made possible by the relationships and partnerships that USACE, Seattle District, established with project stakeholders. As part of this effort, a work group, consisting of current property owners; community members; and representatives of state and federal regulatory agencies, state resource agencies, and tribal governments, was formed for the Manchester Annex Superfund Site. This work group provides a line of communication between USACE and project stakeholders. Several work group meetings were held at key stages in the design and cleanup stages of this project, facilitating progress and preventing delays.

Management Initiatives and Improvements

USACE continues to conduct initiatives to improve its efficiency and effectiveness in the use of its personnel and financial resources, administrative processing of resource documents, functional consolidation of resource responsibilities, and contracting.

In FY98, USACE finished converting the DOS-based FUDS database system to a user-friendly Web-based management information system (FUDSMIS). It also began developing the *FUDS Business Management Plan* based on DoD guidance. In addition, FUDS continues to work with the tri-service RACER (Remedial Action Cost Engineering and Requirements System) users group on the development of RACER 99 software and training requirements. RACER estimates the cost-to-complete for studies, remedial design, remedial action, and other site work; a FUDS version of the RACER 3.2 model was implemented in FY97 for HTRW, CON/HTRW, and BD/DR projects and reporting requirements. The FUDS cost-estimating policy has been modified to incorporate a quality assurance and quality control (QA/QC) process for selection of either RACER, a top-down parametric tool, or the bottom-up detailed cost-estimating tool, the Microcomputer-Aided Cost Engineering System (MCACES).

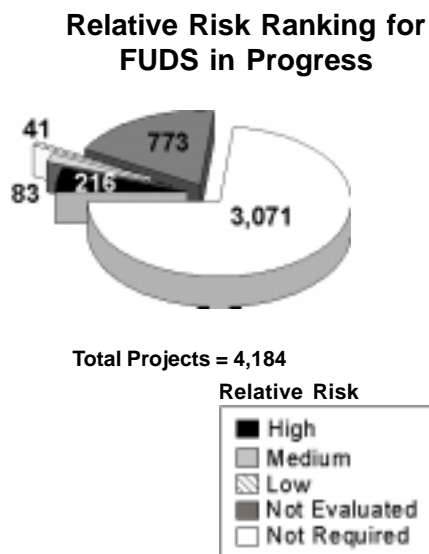
USACE has initiated a new cost management program to ensure that FUDS projects are executed at the lowest reasonable cost. Under this program, USACE determines the precise details of the work involved in various cleanup techniques and the work's typical cost.

The recent USACE reorganization has contributed to resource and organizational efficiencies that are expected to extend the usefulness of future environmental funding. In FY98, USACE management and support costs for the FUDS program fell to approximately 6.3 percent of total program costs, meaning that 93.7 percent of the environmental program's dollars go directly toward project execution at USACE districts.

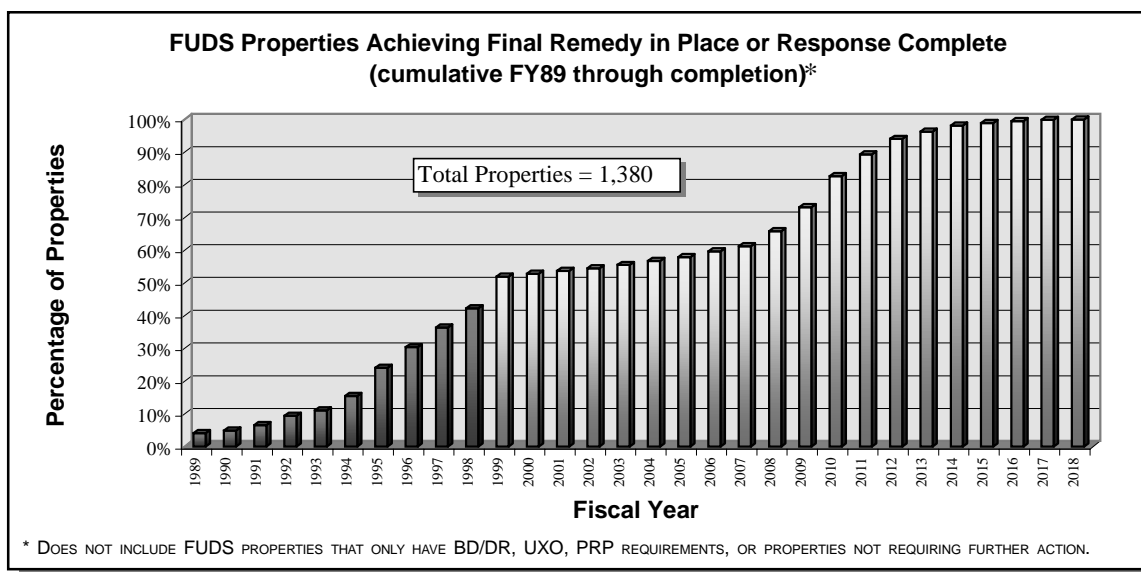
Relative Risk Implementation

New projects are continually being added to the FUDS program. USACE strives to evaluate as many projects as possible for relative risk to human health and the environment. As of the end of FY98, 26 percent of the 892 eligible HTRW projects no longer required relative risk evaluation because they had achieved Response Complete or Remedy in Place status. Another 41 percent of eligible HTRW projects had relative

risk ratings. The remaining 33 percent of these projects, which are ready for site inspection, require future funding for data collection and relative risk evaluation. For CON/HTRW projects, removal of abandoned underground storage tanks has proved to be the most appropriate and cost-effective response. Thus, when funding becomes available, USACE will pursue removal responses at these sites instead of conducting expensive field sampling for relative risk evaluation. USACE has completed response actions for 51 percent of the 1,217 eligible CON/HTRW projects. Another 23 percent of the eligible CON/HTRW projects have removal responses under way. The remaining 26 percent of CON/HTRW sites require future funding for necessary removal responses.



USACE also is required to evaluate OEW projects for relative risk to human safety. OEW risk assessment is composed of hazard severity assessment and hazard probability assessment. Both are based on the best available information from record searches, reports of explosive ordnance disposal teams, field observations, interviews, and actual measurements. Of the 1,471 eligible OEW projects in the FUDS program, 578 have reached Response Complete status and therefore no longer require relative risk assessment. Relative risk assessment codes have been assigned for the remaining 893 OEW projects to indicate their potential impact on human safety.



Ratings of relative risk to human health, human safety, and the environment for HTRW and OEW projects have been used, along with other risk management factors, to aid in sequencing work during FUDS planning, programming, budgeting, and project execution.

Information and Technology Transfer

USACE works closely with the Army and other federal agencies to transfer information and innovative technologies within the environmental community. Innovative technology advocates (ITAs) have been established across the nation to promote such innovative technology transfer and use. The USACE ITAs are actively involved with the Interstate Technology and Regulatory Cooperation (ITRC) Workgroup, which assists state regulators and federal agencies in use of innovative technologies, technical protocols, and regulatory information. In addition, USACE is a primary member of the Web site development subgroup of the Federal Remediation Technologies Roundtable. This group is developing a Web site that will allow access to more than 140 completed case studies, including information on media and contaminant types and technologies used; provide links to other federal Web sites for environmental guidance and policy; and provide a matrix of field sampling and analysis technologies.

USACE is also using innovative technologies in the field to reduce the cost of environmental restoration on more than 225 projects, including those at FUDS. Two FUDS properties where innovative technology is playing a major role are the Naval Ammunition Depot in Hastings, Nebraska, and former Camp McCain in Mississippi.

Outreach

Public involvement is vital to the FUDS program's success. In FY98, USACE continued to work to expand its community relations efforts, ensuring that the public was made aware of the FUDS program and of the opportunities to participate in the cleanup process.

Although every effort is being made to establish Restoration Advisory Boards (RABs) at projects where there is sustained community interest, USACE recognizes that not all properties or projects lend themselves to RAB establishment. Nonetheless, some kind of community involvement and public outreach is required, and FUDS project managers and public affairs specialists are using a wide variety of community involvement techniques to reach out.

During FY98, the FUDS RAB program was extended by the addition of the Technical Assistance for Public Participation (TAPP) program. This program provides community members of RABs and technical review committees (TRCs) with access to independent technical support through the use of government purchase orders. The TAPP program is designed to help community members understand scientific and engineering issues pertinent to environmental restoration activities.

To implement the FUDS TAPP effort, DoD trained 25 district and division FUDS coordinators as trainers to disseminate the program information. The program's execution and benefits are illustrated by the TAPP contract awarded at the former Lowry Bombing and Gunnery Range. Among the tasks included in this contract (which was awarded in March 1998) were reviewing the Engineering Evaluation and Cost Analysis and other documents for the property; attending RAB meetings; and conducting presentations. The contract was essential in obtaining community acceptance of the USACE's procedures and the methodology for investigating and cleaning up the site. The community has been pleased with the results and wishes to continue these services in FY99.

The FUDS program now has 26 active RABs and 2 active TRCs for a total of 37 FUDS properties. No RABs were disbanded in FY98 and five RABs were established, although a few of these had already existed as TRCs before being converted to RABs.

An example of the FUDS program's RAB successes is the work of the former Nebraska Ordnance Plant's RAB. Public participation has been critical to the successful completion of the cleanup at this site. An aspect of the project that heightened the need for community involvement and trust was the construction and use of an on-site incinerator as part of remediation efforts. Because of public concern about this incinerator, a number of public events—beyond what is required by the Comprehensive Environmental Response, Compensation and Liability Act—were held at the site. The site's RAB,



Cleanup Program in Action:

Former Naval Ammunition Depot Experience

USACE, Kansas City District, was recently honored by the State of Nebraska for its innovative methods of cleaning up a formerly used Naval Ammunition Depot in Hastings, Nebraska. Contaminants at the site include volatile organic compounds from solvents, primarily trichloroethene (TCE), and TNT from explosives. Innovative techniques used on this project included horizontal air sparging, soil vapor extraction, in situ bioremediation, and recirculation. The work required cleanup of soil and water contamination at the property.

The district's decision to take a hard look at how it could get the job done in the best way possible led to the innovative techniques used at this site. Cleanup techniques used at the site were initially implemented as small-scale pilot studies and later put into full-scale application.

Use of these new techniques instead of the less efficient, traditional cleanup methods would not have been possible without the understanding and cooperation of the local citizens. This informed support was developed through the cooperation of the U.S. Environmental Protection Agency, the state, and local officials; implementation of RABs; and numerous public meetings. In addition, on October 9, 1998, agencies involved in the cleanup demonstrated to area junior high school students the techniques that environmental officials are using to clean groundwater at the site. Project consultant, Woodward-Clyde of Overland Park, Kansas, demonstrated the four contamination removal techniques. Other participants included the Little Blue Natural Resources District and the Nebraska Department of Environmental Quality (NDEQ).

USACE, Kansas City, has shared its cleanup ideas with local businesses, the state, and the engineering community so that the new methods can be used more widely. Locally, the City of Hastings and several businesses have become involved in the innovative technology efforts at Hastings subsites. Nationally, Nebraska's Governor Nelson has been a strong voice in support of innovative technologies, working through such organizations as the Western and the National Governors' Associations.

The techniques employed at the Hastings site have received several awards from the federal government and the professional engineering community. Several local businesses involved in the cleanup have also been honored. In addition, NDEQ recognized USACE, Kansas City, for its work at the site, presenting the district with its Environmental Excellence award "for the successful implementation of several innovative treatment technologies [at the Hastings site] to restore the environment in Nebraska."

which formed in FY97, received a tour of the incinerator during construction and was kept informed about project status. Public sessions were held in conjunction with the quarterly RAB meetings to allow community members to ask questions about all aspects of the project. In addition, risk assessment issues were presented and explained at several public meetings. Within 2 weeks of the incinerator's "trial burn," the results were summarized and presented to the public. This open presentation of the actual data alleviated many of the concerns of community members. By the end of the project, public trust was high and concern about any potential risk from the incinerator was very low. As a result, USACE was able to minimize down-time costs for the incinerator, and regulators were able to quickly review and approve steps to minimize the incinerator's presence on the site. An added benefit was that public participation in



Cleanup Program in Action: Former Camp McCain Experience

The cleanup at the former Camp McCain illustrates how efficient use of available resources and technology, combined with implementation of new technology, can enhance the quality of work at ordnance-contaminated sites. The project's draft Engineering Evaluation and Cost Analysis is expected to be completed, ahead of schedule, before the end of the 1998 calendar year. Project costs are \$100,000 under budget. In addition, the successful use of promising new technology may yield benefits for other Defense cleanup efforts.

Camp McCain is typical of many of the ordnance sites across the United States. During World War II, it comprised 42,074 acres and supported a wide variety of troop training activities. At its peak, the camp consisted of training, firing, and impact ranges; maneuver areas; and a troop housing and containment area. Today approximately 14,000 acres are used by the Mississippi National Guard; 29,000 acres are privately owned.

To determine the extent of ordnance contamination at the site and to develop and recommend risk reduction alternatives, USACE performed an Engineering Evaluation and Cost Analysis. Geophysical data collection was a key element of the study. Seven former bombing and gunnery ranges, comprising approximately 7,300 acres, were characterized.

USACE's and the contractor's experience with geophysical data collection (i.e., surveys) led to the selection of two types of detection equipment: electromagnetic and magnetic. The electromagnetic EM-61 time-domain metal detector was used in relatively level, open areas; the magnetic 858 magnetometer was used primarily in wooded areas and on hillsides. Surveys were performed in area grids. To estimate the minimum number and approximate locations of grids for characterization of each sector, USACE used the SiteStats statistical package. Approximately 43 of the 7,300 acres were surveyed.

Three quality assurance checks ensured that the data were collected accurately and properly. Crews checked the data logger to ensure that data were collected; then again to ensure that the data were downloaded into a computer. The last and most important check was the contractors' performance of intrusive investigations to validate interpretation of the geophysical data.

The main objective of the intrusive investigation was to safely and efficiently excavate, identify, document, and remove ordnance. The excavations also established baseline readings for the ordnance-locating instruments to further validate the effectiveness of the technologies used and to identify which technologies work best. This check validated the accuracy with which the selected equipment distinguished between ordnance and nonordnance items.

No unexploded ordnance items were found during the excavations; however fragments of ordnance items were recovered at 71 of the 176 nonresidential grids and 29 of the 40 residential grids.

Schonstedt magnetometers were also used at the site to reacquire the anomalies identified, and the traditional "mag and flag" method was used for surveying 2.3 acres in a residential area. Unlike the other technologies used at the site, the Schonstedt magnetometer is not capable of classifying anomalies; however, all anomalies, to a depth of 4 feet, were excavated.

Promising new technology also was used to sample an additional area. A combination of the 858 magnetometer and the Global Positioning System (GPS) enabled USACE to conduct a geophysical survey without establishing grids. This technology shows promise, based on the data collected, because it allows quick, accurate geophysical and positional data collection for a large area.

Selecting the best technology and performing a cost-efficient, validated study are crucial to developing and recommending the best risk reduction methods. But the success of Camp McCain should be measured not only in these site-specific terms, but also in terms of the project's value for future ordnance investigations.

the project enhanced the community's trust in the USACE and other agencies in general. From the beginning of construction to the completion of operations, more than 16,000 tons of contaminated soil was treated.

Funding

Since the devolvement of Defense Environmental Restoration Account funds, funds for DERP cleanup efforts have been distributed into five separate accounts, including one for FUDS. Congress recognized the importance of the FUDS program and appropriated a budget increase of \$40 million for the FUDS program in FY98.

